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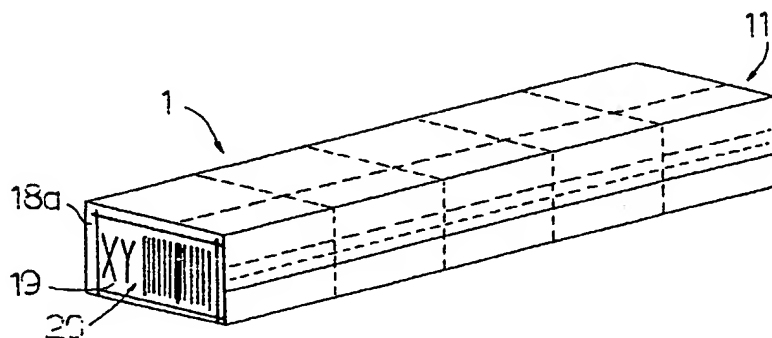
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF PACKING PACKETS OF CIGARETTES, AND SHEET OF PACKING MATERIAL FOR IMPLEMENTING SUCH A METHOD



(57) Abstract: A method of packing packets (2) of cigarettes, in particular an orderly group (1) of packets (2) of cigarettes, wherein the orderly group (1) is packed solely in a sheet (11) of transparent heat-seal plastic packing material, which is folded about the orderly group (1) to form a tubular wrapping having two tubular portions (21) projecting with respect to the orderly group (1), each tubular portion (21) being defined by four flaps (18b, 18c, 18d, 18f) facing in pairs; the flaps (18b, 18c, 18d, 18f) are folded squarely onto the orderly group (1) in a given sequence, so as to

at least partly superimpose the flaps (18b, 18c, 18d, 18f); and the superimposed flaps (18b, 18c, 18d, 18f) are then sealed.

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METHOD OF PACKING PACKETS OF CIGARETTES, AND SHEET OF  
PACKING MATERIAL FOR IMPLEMENTING SUCH A METHOD

TECHNICAL FIELD

The present invention relates to a method of packing packets of cigarettes.

More specifically, the present invention relates to a method of packing an orderly group of packets of cigarettes in a sheet of packing material to form a carton of cigarettes, to which the following description refers purely by way of example.

BACKGROUND ART

Cartons of cigarettes normally comprise ten packets of cigarettes arranged in an orderly parallelepiped-shaped group, which is enclosed in a sheet of paper or in a cardboard blank, and is then wrapped in a sheet of transparent heat-seal plastic material, normally polypropylene.

Each packet of cigarettes is printed on the outer surface with the trademark and brand name of the cigarettes, maker's details, and all compulsory information required by law, and which, in particular,

comprises the content of the cigarettes and a government health warning.

Since legal requirements vary from one country to another, the information printed on the packet must be adapted accordingly.

And the same also applies to cartons, so that the carton packing material (sheet of paper or cardboard blank) must be adapted to each individual country.

#### DISCLOSURE OF INVENTION

It is an object of the present invention to provide a method of packing packets of cigarettes, designed to reduce the cost of conforming with the legal requirements of individual countries.

According to the present invention, there is provided a method of packing packets of cigarettes as recited by Claim 1.

The present invention also relates to a sheet of packing material for implementing the packing method as claimed in Claim 1.

According to the present invention, there is provided a sheet of packing material as recited by Claim 17.

#### BRIEF DESCRIPTION OF THE DRAWINGS

A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a view in perspective, with parts removed for clarity, of an orderly group of packets of

cigarettes;

Figures 2 to 4 show views in perspective of the orderly group in Figure 1 wrapped partly in a sheet of packing material;

5 Figure 5 shows a view in perspective of the orderly group in Figure 1 fully wrapped in the sheet of packing material;

Figure 6 shows a side view of the orderly group in Figure 5 with the sheet of packing material heat sealed;

10 Figure 7 shows a spread-out plan view of a sheet of packing material in accordance with the present invention;

Figure 8 shows a larger-scale plan view, with parts removed for clarity, of a detail of the sheet of packing material in Figure 7;

Figures 9, 10, 11 and 12 show larger-scale plan views, with parts removed for clarity, of variations of the Figure 8 detail.

#### BEST MODE FOR CARRYING OUT THE INVENTION

20 Number 1 in Figure 1 indicates as a whole an orderly group of ten packets 2 of cigarettes. Each packet 2 of cigarettes comprises a front face 3, a rear face 4, two lateral faces 5, a top face 6, and a bottom face 7. Packets 2 in group 1 are arranged in two superimposed layers, each comprising five equioriented packets 2  
25 arranged side by side along respective lateral faces 5. The layers are superimposed so that the front faces 3 in the bottom layer contact the rear faces 4 in the top

layer, and group 1 is therefore in the form of a parallelepiped having two main faces 8 defined respectively by front faces 3 and rear faces 4 of five adjacent packets 2; two lateral faces 9 defined  
5 respectively by top faces 6 and bottom faces 7 of the ten packets 2 defining group 1; and two end faces 10, each defined by the lateral faces 5 of the two end packets 2.

With reference to Figure 7, number 11 indicates a rectangular sheet of packing material made of transparent  
10 heat-seal plastic material, in particular polypropylene. Sheet 11 is sized to fully enclose orderly group 1 of packets 2 of cigarettes, extends along an axis A, and comprises a central panel 12 and two lateral panels 13.

Lateral panels 13 are separated from central panel  
15 12 by two ideal fold lines 14 parallel to axis A. Sheet 11 of packing material also comprises four ideal fold lines 15 perpendicular to axis A and extending solely along central panel 12. The ideal extension of ideal fold lines 15 along lateral panels 13 is defined by slits 16,  
20 each of which has one end along the edge of sheet 11 and one end along ideal fold line 14, and is defined by a cut in sheet 11 of packing material.

With reference to Figure 8, at the end of each slit along relative fold line 14, sheet 11 of packing material  
25 has a hardened portion 17, formed in central panel 12 by locally heating sheet 11 of packing material, to prevent slit 16 from initiating tearing of sheet 11.

With reference to Figure 7, slits 16 divide each

lateral panel 13 into portions 18a, 18b, 18c, 18d and 18e, which, in use, are folded onto an end face 10 of group 1.

Each portion 18d has a non-transparent portion 19  
5 with graphics 20, in particular a bar code and, possibly, a reference number.

With reference to Figure 2, sheet 11 of packing material is folded about group 1 of packets 2 of cigarettes to form a tubular wrapping. That is, central  
10 panel 12 is folded about faces 8 and 9, so that each ideal fold line 15 extends along a respective edge of adjacent faces 8 and 9, and the opposite ends of sheet 11 perpendicular to axis A are superimposed. At the same time, ideal fold lines 14 extend along the edges formed  
15 by end faces 10 with faces 8 and 9, so that lateral panels 13 of sheet 11 of packing material form two tubular portions 21 projecting from opposite ends of group 1. Each tubular portion 21 comprises two parallel, facing flaps 18b and 18d, and two parallel, facing flaps  
20 18c and 18f, wherein flap 18f is defined by overlapping portions 18a and 18e, while flaps 18b, 18c and 18d correspond to the portions indicated by the same reference numbers.

At the next steps in the packing of group 1, flaps  
25 18c and 18f are folded squarely one on top of the other onto face 10 (Figure 3), flap 18b is folded squarely onto flaps 18c and 18f (Figure 4), and flap 18d is folded onto flap 18b (Figure 5). In other words, flaps 18b and 18d

are the same size as end face 10 of group 1, so that, once folding is completed, each end face 10 is covered completely by a respective flap 18d, and the superimposed parts of sheet 11 are then sealed.

5 With reference to Figure 6, end face 10 is covered by superimposed flaps 18b, 18c, 18d and 18f, and flap 18d, which is the last to be folded down, defines the whole of the outside of end face 10. Sealing is effected by locally melting sheet 11 of packing material around  
10 flap 18d, so as to form, around flap 18d, bead seals 22, 23, 24 and 25. Bead seals 22, 23, 24 and 25 extend around, so as not to interfere with, graphics 20, are so arranged as to form an endless path 26 surrounding graphics 20, overlap at opposite ends, and are located  
15 close to respective edges defined by face 10 with faces 8 and 9.

With reference to the Figure 9 variation, as opposed to a hardened portion 17, for each slit 16, sheet 11 has an adhesive label 27 located along central panel 12,  
20 close to the end of slit 16 along ideal fold line 14, to prevent sheet 11 from tearing.

In the Figure 10 variation, slit 16 has a hooked end 28 along fold line 14.

In the Figure 11 variation, the end of slit 16 is  
25 defined by a circular opening 29 along ideal fold line 14. That is, sheet 11 is perforated, by blanking or melting, at the end of slit 16 along ideal fold line 14. Melting comprises forming and hardening the edge of

opening 29 by approaching the portion of sheet 11 for perforating with the end of a heated rod, and provides for more effective tear resistance.

In the Figure 12 variation, slit 16 is defined by a slot 30 having two opposite edges 31 connected by a semicircle 32 at the end along fold line 14. Slot 30 may be formed by blanking or melting.

In another variation not shown, only one lateral panel 13 has slits 16, the other lateral panel 13 being whole, and the relative tubular portion being closed by forming pleats.

In another variation not shown, only portion 18d with graphics 20 is detached by slits 16 from the rest of lateral panel 13.

Regardless of the form of, and the means employed to produce, slits 16, each sheet 11 of packing material is formed from a web of polypropylene (not shown) on a packing machine (not shown).

Sheet 11 of packing material is first detached from the web, and slits 16 then formed as shown in any one of Figures 8 to 12.

In one variation, slits 16 are formed before sheet 11 of packing material is detached from the web.

The variations of slit 16 shown in Figures 8 to 12 can all be obtained by cutting, blanking, or combined cutting and blanking; and opening 29 and slot 30 can be obtained indifferently by blanking or melting.

All the above operations are performed on the



packing machine (not shown) from which the web (not shown) is unwound.

Combined with the method described, sheet 11 of packing material has various advantages. In particular, it provides for packing group 1 of packets 2 of cigarettes into a carton with a single, as opposed to a double, wrapping, and allows visibility of the content of the carton, and the compulsory information, brand name and trademark on packets 2. Moreover, since each carton has distinctive markings, such as a bar code indicating the price of the carton as a whole, the end faces of the carton can be used for this purpose, by the sheet of packing material at the end faces having no pleats or seals affecting legibility of the bar code.

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CLAIMS

1) A method of packing packets of cigarettes, in particular an orderly group (1) of packets of cigarettes; the method comprising the steps of folding a sheet (11) of heat-seal plastic packing material about said orderly group (1) to form a tubular wrapping having two tubular portions (21) projecting with respect to the orderly group (1), each tubular portion (21) comprising four flaps (18b, 18c, 18d, 18f); folding each flap (18b, 18c, 18d, 18f) onto the orderly group (1), so as to at least partly superimpose said flaps (18b, 18c, 18d, 18f); and sealing the superimposed flaps (18b, 18c, 18d, 18f) to one another; the method being characterized by packing said orderly group (1) solely in said sheet (11) of packing material; said sheet of packing material being transparent, so that said packets (2) are visible through the sheet (11) of packing material.

2) A method as claimed in Claim 1, wherein said orderly group (1) has two main faces (8), two lateral faces (9), and two end faces (10); said flaps (18b, 18c, 18d, 18f) being superimposed on said end faces (10).

3) A method as claimed in Claim 1 or 2, wherein the outer flap (18d) has a portion (19) bearing graphics (20).

4) A method as claimed in Claim 3, wherein said flaps (18b, 18c, 18d, 18f) is sealed by melting the sheet (11) of packing material to define at least one bead seal

(22, 23, 24, 25) outwards of said graphics (20).

5        5) A method as claimed in Claim 3 or 4, wherein said at least one bead seal (22, 23, 24, 25) defines an endless path (26) surrounding said graphics (20).

6) A method as claimed in Claim 5, wherein said  
endless path (26) is defined by a number of adjacent bead  
seals (22, 23, 24, 25).

7) A method as claimed in Claim 6, wherein said  
adjacent bead seals (22, 23, 24, 25) overlap.

10       8) A method as claimed in any one of Claims 5 to 7,  
wherein each said bead seal (22, 23, 24, 25) is located  
close to an edge of said orderly group (1).

9) A method as claimed in any one of Claims 1 to 8,  
wherein said sheet (11) of packing material comprises a  
15       central panel (12), and two lateral panels (13) separated  
ideally from the central panel (12) by two ideal fold  
lines (14); the method comprising forming slits (16)  
along the lateral panels (13), and which extend between  
the edges of the sheet (11) of packing material and said  
20       ideal fold lines (14) to define a number of portions  
(18a, 18b, 18c, 18d, 18e) defining said flaps (18b, 18c,  
18d, 18f).

10) A method as claimed in Claim 9, wherein each  
slit (16) is formed by cutting said sheet (11) of packing  
25       material.

11) A method as claimed in Claim 9, wherein each  
slit (16) is formed by cutting and blanking to remove  
part of the sheet (11) of packing material.

12) A method as claimed in Claim 10 or 11, wherein a portion (17) of said sheet (11) of packing material at one end of said slit (16) is thermally perforated and hardened.

5 13) A method as claimed in Claim 10 or 11, wherein an adhesive label (27) is applied to said sheet (11) of packing material at one end of said slit (16).

14) A method as claimed in Claim 9, wherein each slit (16) is formed by cutting said sheet (11) of packing material, combined with melting the slit (16) at one end of the slit (16).

15) A method as claimed in Claim 9, wherein each slit (16) is formed by melting part of said sheet (11) of packing material.

15 16) A method as claimed in any one of Claims 9 to 15, wherein the sheet (11) is detached of packing material from a continuous web of heat-seal plastic material.

17) A sheet of packing material for implementing the method of packing packets (2) of cigarettes as claimed in any one of Claims from 1 to 16, said sheet (11) of packing material being characterized by being made of transparent heat-seal plastic material, and by comprising a central panel (12), and two lateral panels (13) defining the projecting tubular portions (21) when the sheet (11) of packing material is folded about the orderly group (1) to form a tubular wrapping; each lateral panel (13) having slits (16) dividing the lateral

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panel (13) into adjacent portions (18a, 18b, 18c, 18d, 18e) defining said flaps (18b, 18c, 18d, 18f) of a respective projecting tubular portion (21).

18) A sheet of packing material as claimed in Claim 5 17, wherein each lateral panel (13) extends between a free edge of the sheet (11) of packing material and an ideal fold line (14).

19) A sheet of packing material as claimed in Claim 18, wherein each slit (16) has a first end located at 10 said free edge, and a second end located between said free edge and said ideal fold line (14).

20) A sheet of packing material as claimed in Claim 19, wherein said second end is located at said ideal fold line (14).

15 21) A sheet of packing material as claimed in Claim 19 or 20, wherein, at said second end, each slit (16) is curved to prevent initiating a tear in said sheet (11) of packing material.

22) A sheet of packing material as claimed in Claim 20 20, wherein said second end of the slit (16) is defined by an opening (29) bounded by a curved endless edge.

23) A sheet of packing material as claimed in Claim 22, wherein said opening (29) is formed by blanking the sheet (11) of packing material.

25 24) A sheet of packing material as claimed in Claim 22, wherein said opening (29) is formed by melting the sheet (11) of packing material.

25) A sheet of packing material as claimed in Claim

21, wherein said second end of the slit (16) is in the shape of a curved hook (28).

26) A sheet of packing material as claimed in Claim 20, wherein each slit (16) is defined by a slot (30) having two opposite edges (31) connected by a curved side (32) at the second end.

27) A sheet of packing material as claimed in Claim 18 or 19, and comprising an adhesive label (27) at the second end of each slit (16) to prevent initiating a tear in said sheet (11) of packing material.

28) A sheet of packing material as claimed in Claim 18 or 19, and comprising a thermally hardened portion (17) of the sheet (11) of packing material at the second end of each slit (16) to prevent initiating a tear in said sheet (11) of packing material.

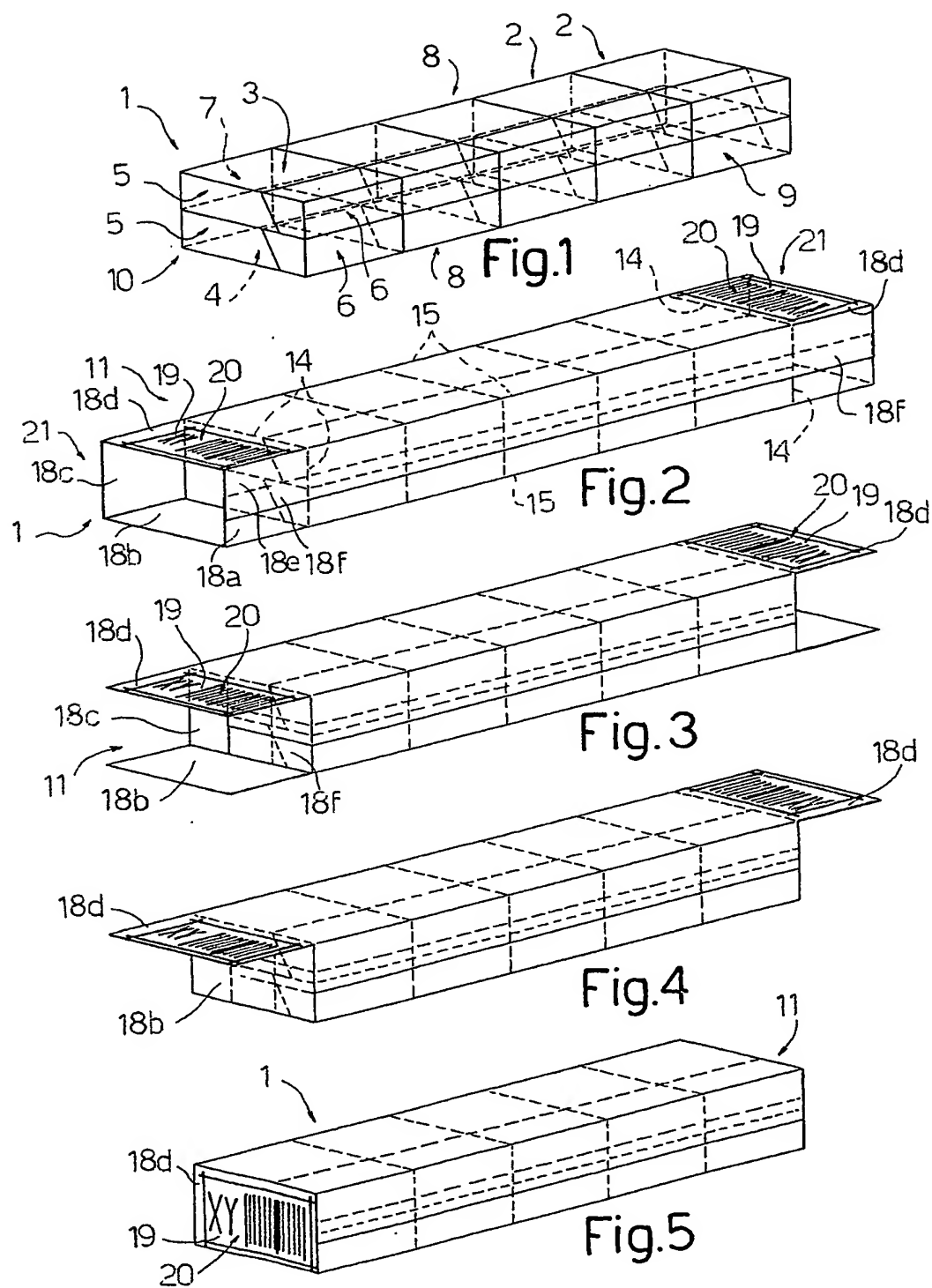
29) A sheet of packing material as claimed in any one of Claims 17 to 28, wherein at least one of said portions (18a, 18b, 18c, 18d, 18e) has graphics (20).

30) A sheet of packing material as claimed in Claim 29, wherein said graphics (20) comprise a bar code.

31) A sheet of packing material as claimed in Claim 29 or 30, wherein said graphics (20) are located on a non-transparent portion (19) of said sheet (11) of packing material.

32) A sheet of packing material as claimed in any one of Claims 17 to 31, wherein said sheet (11) is made of polypropylene.

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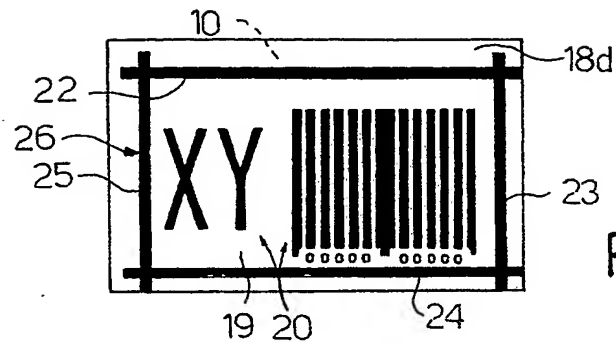


Fig. 6

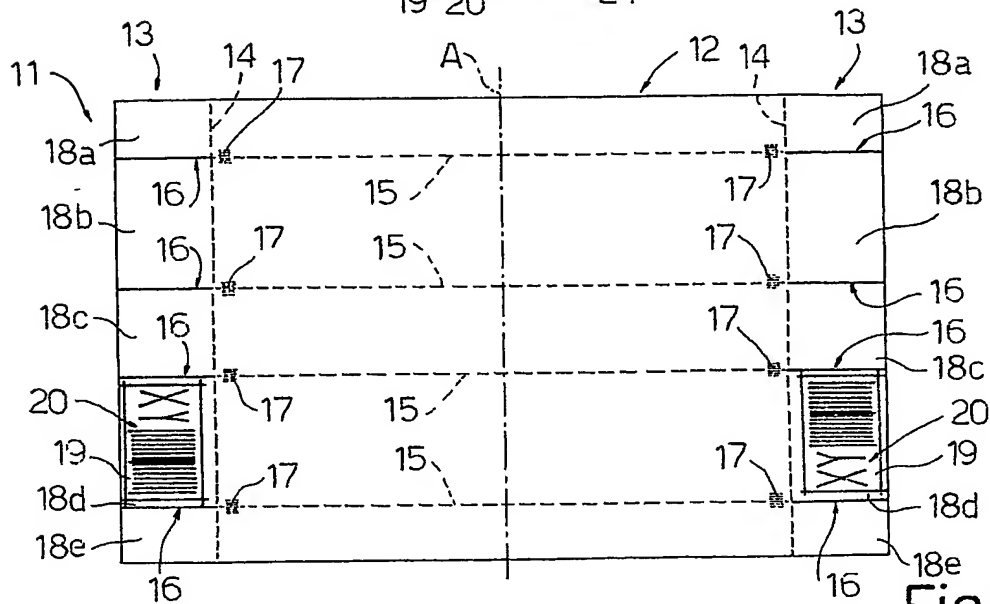


Fig. 7

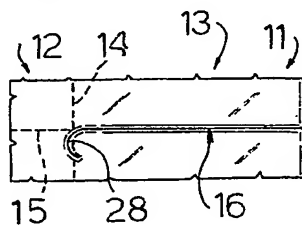


Fig. 8

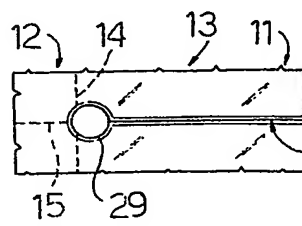


Fig. 9

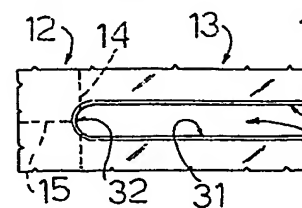


Fig. 10

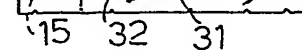


Fig. 11



Fig. 12



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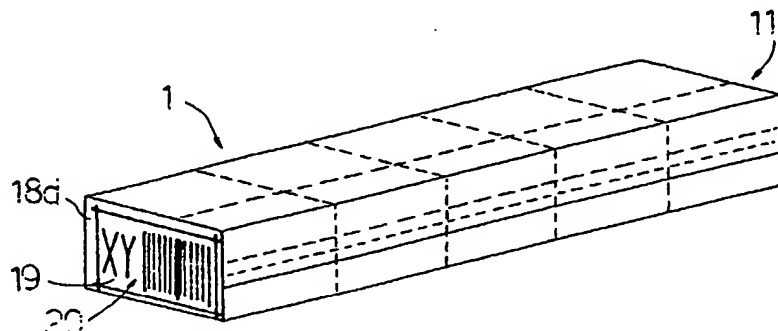
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superimpose the flaps (18b, 18c, 18d, 18f); and the superimposed flaps (18b, 18c, 18d, 18f) are then sealed.

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/50113

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B65D85/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 784 261 A (KUTCHIN SIDNEY W) 15 November 1988 (1988-11-15) page 2, line 19 - page 3, line 40; figures	1-3
A	US 3 809 227 A (BEGEMANN C) 7 May 1974 (1974-05-07) figures	1
A	US 3 051 305 A (HOULE JAMES A) 28 August 1962 (1962-08-28) figures	1
A	US 3 278 016 A (CONTI JOHN D) 11 October 1966 (1966-10-11) figures	1
A	US 3 027 998 A (RIDGWAY ROBERT J) 3 April 1962 (1962-04-03) figures	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

19 August 2003

Date of mailing of the international search report

27 November 2003

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
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Authorized officer

Fournier, J.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 03/50113

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-26

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16

Subject I (claims 1-16) relates to a method of packing packets of cigarettes with a sheet of packing material folded about an orderly group of packets of cigarettes to form a tubular wrapping having two tubular projecting portions. Each tubular projecting portion comprises four flaps, the outer flap having a portion bearing graphics. Furthermore, the flaps are sealed by melting the sheet of packing material to define at least one bead seal outwards the graphics.

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2. claims: 17-32

Subject II (claim 17-32) relates to a sheet of packing material comprising a central panel and two lateral panels, each lateral panels having slits dividing the lateral panels into adjacent portions in order to define flaps.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/50113

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4784261	A	15-11-1988	NONE	
US 3809227	A	07-05-1974	SU 505342 A3 ZA 7307843 A	28-02-1976 28-08-1974
US 3051305	A	28-08-1962	NONE	
US 3278016	A	11-10-1966	NONE	
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